

Remarks

Claims 1-37 are pending in this application, with claims 12-15, 24-27, 33 and 34¹ being indicated as being allowable if rewritten to be in independent form. As a result, claims 1-11, 16-23, 28-32 and 35-37 are at issue. Various one of the claims have been amended herein to delete the term "adapted to" and to positively indicate that the recited system or method relates to a communication bus that transmits electrical signals between different process devices, such as different field devices, process controllers and I/O devices within a process plant. As this limitation is believed to be inherent in the original claim language, applicants are not amending the claims for patentability purposes and do not believe that the amendments made herein limit the claims in any manner over the claims as originally filed. Instead, these amendments are made to render the claims more clear as to their original scope.

35 U.S.C. §102 and §103 Rejections

Applicants respectfully traverse the rejections of claims 1-11, 16-23, 28-32 and 35-37 as anticipated by Eryurek et al. (U.S. Pat. No. 6,594,603) ("Eryurek") or as obvious over Eryurek in view of Christensen et. al. (U.S. Pat. No. 6,912,671) ("Christensen"). Of these, claims 1, 16 and 31 are independent claims. Generally speaking, each of claims 1, 16 and 31 recites a system or a method for use in hazardous area of a process plant which provides protection with respect to faults which occur within a communication bus disposed within a hazardous area of the process plant and, in particular, to prevent electrical faults within the bus from causing sparks, explosions or other safety problems within the hazardous area of the process plant. In particular, each of these claims recites a method or structure which detects a fault condition within the communication bus and which interrupts the flow of electrical signals along one or both of the first and second transmission paths of the communication bus in response to the detected fault condition. This method and

¹ The examiner indicates that claims 33 and 34 are "objected to" on the Office Action Summary Sheet and specifically indicates that these claims would be allowable if rewritten to be in independent form on page 10 of the Final Office Action. However, the examiner also indicates that claims 33 and 34 are rejected on pages 6, 9 and 10 of the Final Office Action. Applicants respectfully request clarification of this issue, but will assume that these claims are objected to and would be allowable if rewritten to be in independent form based on the Office Action Summary Sheet.

structure prevents electrical signals from being able to pass through the communication bus when a fault condition occurs on the bus, thereby preventing unwanted current flow and sparks in or around the bus when the bus has a fault, which might otherwise lead to sparks and explosions within the hazardous area of the process plant.

Simply put, Eryurek fails to disclose a switch or any other device which is coupled to a fault detection device that detects a fault within a communication bus and which operates to interrupt the flow of electrical signals within the communication bus in response to the detected fault condition, as required by each of the pending claims. As a result, Eryurek fails to anticipate or to render any of the claims at issue obvious.

In particular, Eryurek discloses a device testing technique that can be used in various types of process control devices (such as sensors, valves, motors, etc.) to detect the improper or degraded operation of the process control device and which operates to alert a maintenance person or other operator of the degraded or faulty condition of the device. In particular, the Eryurek system performs a resistive measurement within the device being tested and compares the measured resistance to a known or expected resistance value to determine whether the device, e.g., the sensor, is operating properly or up to expectations. While it can be argued that Eryurek generally discloses fault detection circuitry within a process control device, the similarity between the Eryurek system and the recited invention ends there. In particular, Eryurek does not address and does not suggest detecting fault conditions in a communication bus (which is not actually a process control device itself, like a sensor, a valve, a motor, etc.), and thus Eryurek does not address or detect fault conditions in first or second transmission paths associated with a communication bus that transmits signals between different process devices within a process plant, as is recited by the claims at issue. Instead, Eryurek is directed solely to the measurement or detection of faults within actual field devices such as valves, motors, and switches.

Moreover, and importantly, Eryurek does not disclose circuitry of any type that interrupts the transmission of electrical signals on a communication path of a communication bus disposed between different process devices for any reason, much less in response to the detection of a faulty condition within a device. In other words, while the Eryurek system detects the degradation or poor performance of field devices, such as temperature sensors, etc. within a process plant, the Eryurek system

merely alerts a user or other maintenance person of the detected fault condition so that person may effect repair or replacement of the faulty device. See, e.g., Eryurek, col. 6, lines 44-58 and col. 8, lines 57-64. The Eryurek system does not interrupt the flow of electrical signals anywhere in the system in response to the detection of the fault condition, much less interrupt the flow of electrical signals within a communication bus in response to the detection of a fault condition. In fact, the Eryurek system does not remove the faulty device from operation within the plant in any manner, which is much different than the recited system and method which actually prevents the operation of the communication bus in response to the detection of the fault condition on the bus.

Moreover, Eryurek does not disclose or suggest that it is desirable or even possible to disconnect a field device or any subcomponent of a field device in response to the detection of a fault condition. To contrary, disconnecting a process control device in response to a detection of a faulty or improper operating component would remove the device from the system, which is not something the Eryurek system contemplates, and is not something that would be particularly useful in a process plant.

The examiner has simply failed to identify any switch or other component of the Eryurek system which operates to actually disconnect or interrupt a communication line of a bus to prevent that communication line from transmitting signals between one process device and another process device in response to a detected fault condition, as is recited by each of the claims at issue. The only reference in Eryurek that the examiner points to for the functionality of interrupting the flow of electrical signals along a first or second transmission paths of a communication bus in response to the detection of a fault condition is at Eryurek, col. 8, line 65 to col. 9 line 6. However, this section, which is repeated below, says nothing about using a switch to disconnect a transmission line of a communication bus, much less using a switch to disconnect a transmission line of a communication bus in response to the detection of a fault condition associated with the communication bus (e.g., with one or more of the transmission lines).

“The various diagnostic functions set forth herein can be performed remotely, in a process control device, in the control room, in a computer located off-site or in a combination of these locations. Generally, the invention can be practiced in any of a number of places in a process system control system. In particular, the present

invention as realized in software and a microprocessor, can reside in a central controller or even a final control element such as a valve, motor or switch." Eryurek, col. 8, line 65 to col. 9, line 6.

The only mention of a "switch" in this section of Eryurek is in the context of the process control device in which the invention of Eryurek (related to a method of performing a resistive test) can be used. Thus, in the context of the Eryurek disclosure, a "switch" is a well-known process control device that operates to switch some element on or off or to perform some other switching function, such as switching the flow of fluids or current within a process control plant. The fact that Eryurek mentions that its resistive testing technique can be used in a "switch" does not amount to a disclosure that a switch is used to interrupt the flow of electrical signals along one of the first and second transmission paths *in response to a detected fault condition*, as is recited by each of the claims at issue. In other words, Eryurek's mention that its resistive testing technique can be used in a switch type of process control device (apparently to detect abnormal operation of the switch itself), does not amount to a disclosure that a switch should be used to interrupt the flow of electrical signals within a communication line of a communication bus in response to a detected abnormal or faulty operation of anything, much less in response to the faulty operation of the communication bus.

Applicants respectfully submit that the examiner is merely taking bits and pieces of Eryurek, which discloses various elements having names that are similar to the names of the elements recited within the claims, and combining these bits and pieces of the Eryurek system in a manner not disclosed or suggested by Eryurek to produce the claimed invention. In particular, Eryurek does not disclose operating a switch or any other element to interrupt the flow of electrical signals in a first or second transmission line of a communication bus disposed between different process devices in response to the detection of a fault condition of any type, much less in response to the detection of a fault condition within the communication bus itself, as is recited by each of the claims at issue.

In summary, Eryurek is directed to the detection of a faulty or suboptimal operating condition within an actual field device (such as a sensor, a motor or a switch), and performs a resistive test merely to alert a user of the suboptimal condition of the device. Eryurek is not concerned with, and does not disclose doing anything with respect to a communication bus, much less interrupting a

communication line of a communication bus. Furthermore, even if the Eryurek resistive testing technique could be used in the communication bus, there is no teaching within Eryurek to actually disconnect elements of that communication bus from each other in response to the detection of a fault condition. In fact, the only operation that the Eryurek system takes in response to the detection of a fault (or suboptimal condition), is the notification of such a fault to a user or maintenance person. This operation does not require or use a switch of any kind, much less one that disconnects a communication bus over which, for example, the fault notification might be sent to the user or maintenance person.

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.”

Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). MPEP 2131. “The identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). MPEP 2131. Because Eryurek fails to disclose or suggest using a switch or any other element to interrupt the flow of electrical signals on a communication bus in response to the detection of a fault condition within the communication bus, as recited by each of the claims at issue, Eryurek fails to anticipate any of these claims.

Moreover, while the examiner has not cited Christensen for this element, Christensen also fails to disclose the use of a switch to disconnect a line of a communication bus in response to a detection of a fault condition within a bus. As a result, no combination of Eryurek and Christensen results in the claimed invention, and therefore no combination of Eryurek and Christensen renders any of the pending claims obvious.

Conclusion

For the reasons provided above, applicants respectfully request reconsideration and allowance of claims 1-37.

This response is being submitted with a petition for a one-month extension of time and an RCE, along with the requisite fees therefore. Although applicants believe that no other fees are due, the Commissioner is hereby authorized to charge any fees or credit any overpayments to Deposit Account No. 13-2855 of Marshall, Gerstein & Borun LLP. In addition, if a petition for a further extension of time under 37 CFR 1.136(a) is necessary to maintain the pendency of this case and is not otherwise requested in this case, applicants request that the Commissioner consider this paper to be a request for an appropriate extension of time and hereby authorize the Commissioner to charge the fee as set forth in 37 CFR 1.17(a) corresponding to the needed extension of time to Deposit Account No. 13-2855 of Marshall, Gerstein & Borun LLP.

If there are matters that can be discussed by telephone to further the prosecution of this application, applicants respectfully request that the examiner call its attorney at the number listed below.

Respectfully submitted,

Dated: February 19, 2007

By: 
Roger A. Heppermann
Reg. No: 37,641

MARSHALL, GERSTEIN & BORUN LLP
6300 Sears Tower
233 South Wacker Drive
Chicago, Illinois 60606-6402
(312) 474-6300